Foreign Labour in Malaysian Manufacturing : Trends, Patterns and Implications for Domestic Wages

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Abstract: The growing presence of foreign workers has sparked a continuing debate in labour importing countries in East Asia on the socio-economic consequences of labour inflows and the policy options for dealing with the 'foreign worker problem'. At the heart of this debate is the concern that heavy dependence on foreign workers could suppress domestic real wages with adverse implications for economic restructuring and productivity growth. The purpose of this paper is to inform this debate through a case study of Malaysia, a country where increased presence of temporary foreign workers have played a key role in manufacturing growth over the past two decades. The first four sections of the paper provide an overview of Malaysian labour market policy, structural change and labour absorption, and emerging patterns of foreign worker presence in the manufacturing sector. This is followed by an econometric analysis of the determinants of inter-industry patterns of foreign worker dependence and wage differentials using a new panel dataset. The analysis focusses on the relative importance of foreign worker dependence in determining wage trends compared to other influences relating to the structure and conduct of domestic manufacturing. It is of course not possible to generalize from a single country case, but our results do call for a reconsideration of general perception that foreign workers suppress wages.

Keywords: International labour migration, foreign workers, wages, Asia, Malaysia

JEL Classification: F22, J31, J61, O53

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1. INTRODUCTION

The growing presence of foreign workers has sparked a continuing debate in labour importing countries in East Asia on the social and economic consequences of labour inflows and the policy options for dealing with the 'foreign worker problem'. A key concern of this debate is that influx of cheap foreign labour suppresses domestic wage growth, with adverse implication for long-term growth and improvement of economic welfare of native workers. In this view, availability of low-wage immigrant labour forestalls skill upgrading and modernization of technology in the domestic economy that might have occurred otherwise. Regulating labour inflows so that foreign workers are made available only to supplement native workers and not to replace them has, therefore, become a contentious issue in policy debates in labour importing countries (Ducanes and Abella 2008, Hugo 2004, Lee 2002).

Despite the prominence given to this issue in public policy debate, there is a dearth of systematic empirical research on the impact of foreign worker presence on domestic wages in labour-importing countries in East Asia. The debate is largely driven by *a priori* theorizing and casual empiricism. There is of course a large empirical literature on the experiences of the traditional immigration countries in the North.[1] However, it is hazardous to generalise from this literature because labour market consequences of immigrants are likely to vary across countries depending on the types of immigrants, local labour market conditions and the stage of development.

The paper aims to fill this knowledge gap through a case study of Malaysia. Malaysia is an interesting 'laboratory' for an in-depth study of the issue at hand, given its heavy dependence on foreign workers and the emphasis placed on the migration issue in the public policy debate. Malaysia is the biggest net importer of labour in Asia with a migrant labour force of around 2 million (21 percent of the total work force) as of 2008 (Ministry of Finance 2010). There is a growing

concern in the Malaysian policy circles that wage suppression resulting from the heavy dependence on migrant labour is a key factor that has locked the Malaysian economy in the 'the middle income trap' (NEAC 2010, p.59). The reform initiatives under consideration for dealing with the 'foreign worker problem' include enforcing equal labour standards for local and foreign workers, instituting minimum wages[2] and revamping and streamlining of the present worker levy system (which has been in place since 1992) to achieve specific limits on the entry of unskilled foreign labour in line with national priorities of industrial upgrading/restructuring (NEAC 2010, Ministry of Finance 2010).

In this paper we focus specifically on the experience of Malaysian manufacturing because the contemporary debate on the wage effect of migrant labour is specifically focussed on this sector. Also data of reasonable quality required for the analysis are available only for this sector. The core of the paper is an econometric analysis of the impact of foreign worker dependence on inter-industry wage differentials using a new panel data set, paying attention to possible simultaneity involved in the relationship between the two variables. This is embodied in a survey of emerging patterns of foreign worker presence in the manufacturing sector. We do find a statistically significant negative impact of foreign worker presence on real wages, but the magnitude of the impact is rather small. Our results suggest that variables relating to the structure and performance of domestic manufacturing are far more important than foreign worker dependence in explaining real wage behaviour.

The rest of the paper is organized as follows. Section 2 surveys Malaysia's labour market policy and policies relating to migrant workers. Section 3 provides an overview of structural changes and labour market tightening that set the stage for the influx of migrant workers. Section 4 provides an overview of the trends and characteristics of migrant worker presence for the ensuing empirical analysis in the next section. Section 5, which forms the core of the paper, undertakes an econometric analysis of the determinants of real wages in Malaysian manufacturing using a plant-

level panel data set. It begins with a snapshot view of wage patterns, and then discusses model formulation, variables construction and econometric methodology, followed by an interpretation of econometric estimates, focussing on the relative importance of foreign worker dependence in determining wage trends compared to other influences relating to the structure and conduct of domestic manufacturing. The paper ends in Section 6 with some concluding remarks.

2. LABOUR MARKET POLICY

Malaysia has an industrial relation system carefully designed to avoid potential trade-off between the rate of economic growth and the welfare of the work force. Over the years, government legislation have hobbled trade unions and regulated collective bargaining. There are also no minimum wage legislation or unemployment benefits. At the same time the government has developed and carefully administered a comprehensive mechanism for protecting workers rights and providing them with handsome social benefits and services in an overt fashion. From about late 1980s, Malaysia has been in the midst of a debate on appropriate national policy towards migrant workers. Over the past two decades regulating the influx of foreign workers has been a key focus of labour market policy.

Overall Policy Setting

A striking feature of the Malaysian labour market scene throughout the post-independence era (since 1958) is the weakness of the trade union movement and its lack of political influence. In 1980, about 25 per cent of wage-earning workers were unionized, but by mid-1990s this figure had fallen to about 15 per cent. When workers in the plantation sector, the traditional power base of the union movement, are excluded the latter figure drops to a mere 6 per cent. By the mid-1990s, collective agreements covered only around 120,000 workers (1.4 per cent of total employment in the country)[3].

In 1965, as part of the 'confrontation emergency' (emergency declared following the Indonesian confrontation began in 1963), the government promulgated regulations that allowed the

Minister of Labour to refer industrial disputes to compulsory arbitration. Following the ending of the confrontation in 1966, these emergency labour regulations were incorporated in a new Industrial Relations Act in 1967. The Act also made it unlawful to use trade union funds for achieving political objectives. Another provision of the Act required unions to be based on 'particular' or 'similar' trades, occupations or industries', thus precluding the possibility of forming large general unions covering workers in different fields.

Attempts to restrict trade union activities received added emphasis as part of the new policy orientation towards export-led industrialization (as part of the government's drive to attract foreign capital in manufacturing). In 1974, when the global electronics companies started establishing assembly plants in Malaysia, apparently the government reached an understanding with foreign electronics companies not to allow unionization of workers. In 1976, when the Electrical Industry Workers Union attempted to enroll workers employed in the electrical and electronics (E&E) industry, the Registrar of Trade Unions ruled that the E&E industries were not similar and hence it was unlawful for electronics workers to join the union. Attempts by electronics workers to form a union of their own under the umbrella of the Malaysian Trade Union Congress (MTUC) was repeatedly rejected by the government until 1988 when the formation of in-house unions limited to individual plant rather than a national union was permitted. In the textile and garment industry, the government also prevented the formation of a national union combining state and regional unions.

The Industrial Relations Act was amended in 1977 to set the framework for maintaining strong government control over the conduct of collective bargaining. Under this amendment, the Minister of Labour was empowered to refer wage disputes to an Industrial Court if conciliators appointed by the Industrial Relations Department of the Ministry were not able to achieve an agreement among the parties involved. Once a dispute is referred to an Industrial Court, the workers do not have the right to strike, that is, they must accept compulsory arbitration. Legislation enacted in 1988 changed rules of collective bargaining, with a view to expediting dispute settlement and to

minimizing the possible dominance of the interests of unions over those of workers in the bargaining process.

Under the Wage Council Act of 1947, the Minister of Labour has the power to lay down minimum wages (and other conditions of employment) through setting up of a National Wage Council in trades or industries, with a view to providing protection for certain categories of workers[4] in the absence of effective collective bargaining or other mechanisms to protect their rights. However, this legislation has hardly been used over the past four decades. By the mid-1990s, the total number of workers covered by minimum wage legislation amounted to a little over 200,000 (2 per cent of total employment in the country) and in most cases minimum wages, being well below actual (market determined) wages, had little impact on labour market behaviour.

Given government legislation that has continuously hobbled trade unions and collective bargaining, by and large conditions of labour in Malaysia are determined unilaterally by employers within the confines of the existing labour legislation. However, this does not mean that workers in Malaysia have been marginalised in the process of distribution of gains from economic expansion. Malaysia has a surprisingly good, orderly system of industrial relations for providing workers with a wide range of social benefits and services which cover contingencies such as old age, employment injury, occupational diseases, disability and invalidity.

There are two formal social security schemes currently in operation for employees in the private sector, namely the Employees' Provident Fund (EPF) and the Employees Social Security Scheme (ESSS). The EPF, established in 1951 under the EPF Ordinance 1951 (subsequently replaced by the EPF Act 1991), is the premier social security organisation in the country. It is a compulsory saving scheme[5], which provides from the accumulation of saving by individual workers (private and non-pensionable workers) through a direct deduction from their monthly earnings (currently equal to 11 percent) and a contribution from the employer (minimum of 12 per cent). Each individual employee has a separate account, which is also credited with accrued interests. The

employee may withdraw one-third of accumulated saving at the age of 50 and the entire balance on retirement at age 55.

The EPF was originally set up as a scheme of old age protection. However, over the years, it has expanded the range of benefits for its members to include a number of pre-retirement benefits. These include paying an additional amount for death benefits over and above the EPF savings to the next-of-kin of a deceased member (1977), allowing withdrawal of funds (up to 40 per cent) funds for residential housing (1982), and paying incapability benefits to members over and above the EPF (1986).

The ESSS, a compulsory social insurance scheme[6], was introduced in 1971 under the Employees Social Security Act of 1969. All enterprises employing 5 or more employees are required to register with the Social Security Organization (SOCSO). There are two schemes to cover the contingencies of employment injury, occupational disease and invalidity or death: the Employment Injury Insurance Scheme (EIS) (introduced in 1971) and the Invalid Pension Scheme (IPS) (introduced in 1974). The EIS covers the contingencies of injury and death arising out of and in the course of employment. Contribution for EIS is solely paid by the employer at the rate of 1.75 per cent of the employee's monthly wage. In the case of IPS, the contribution is 1 per cent of montly wages, shared equally by the employer and employee. These are very generous: 80 per cent of the previous wage for temporary disability and 90 percent for permanent disability. All workers employed under a contract of service and earning RM3,000 (revised from RM2,000 in 2007) or less are covered by these schemes.

This elaborate system of industrial relations and worker welfare provision has certainly ensured orderly labour relations and industrial peace. The average number of strikes per year declined from 35 in 1970s to 22 in 1980s and 15 in the 1990s. The average number of wage earners involved in strikes in a given year during these three decades never exceeded 0.2 per cent of the total workforce. Labour market flexibility has played a key role in facilitating growth through labour

intensive manufactured exports with foreign capital participation. Given the high international mobility of such production, growth of output and employment would have been severely constrained had artificially high real wages or regulations driving up labour costs been enforced through union pressure or government intervention.

Policy on Migrant Workers

Malaysia's policy on the entry of semi-skilled and unskilled foreign workers has reflected a reaction to short-term needs and labour shortages rather than an active and well thought out approach to meeting long-term labour needs. Since the early 1980s, the government has made some attempts to prevent illegal immigration and to regulate labour inflows. A chronology of key policy shifts is provided in Table 1.

A key element of the regulatory mechanism is bilateral agreements signed with labour exporting countries, under which skill requirements and the sectors in which the workers are to be employed. By selecting countries with which it signed agreements, Malaysia determines the nationality of migrant workers. The first agreement (the Medan Agreement) was signed with Indonesia in 1984. Under this agreement, Indonesia was to supply workers in six employment categories whenever requested by Malaysia. A second agreement was signed in May 2004. Malaysia has also bilateral agreements with the Philippines, Thailand, Bangladesh, Vietnam and Sri Lanka. Private-sector employment agencies are permitted to recruit migrant workers from these countries.

There are basically two types of work permits. Unskilled and semiskilled workers (those earning less than RM2,500 per month) are issued *visit passes for temporary* employment valid for a year, which can be renewed annually for a maximum of three years (increased to 5 years in 2001). Entry visas to professional workers are issued relatively liberally in all sectors and all occupations, except those that have direct implications for national security. Professional workers/ expatriates are issued employment passes with contracts of at least two years. In manufacturing, five expatriate

posts are automatically allowed for new investments with paid-up capital of US$2 million and above, and one key post if the paid-up capital is RM500,000. The employment of expatriates was further encouraged by the government after the launching of the Multimedia Super Corridor (MSC) under the Seventh Malaysia Plan. Industries established within the MSC, launched in 1996, are permitted to recruit an unlimited number of expatriates. More recently, the government employed skilled expatriates from China and India in the manufacturing sector (Ministry of Finance 2010).

An annual foreign worker levy, which varies by sector and skill category, was introduced in 1991. Currently, the annual levy is RM540 for the plantation sector, RM 900 for semi-skilled workers in services sectors and RM2,400 for skilled workers. A mandatory contribution by employers to the EPF on behalf of migrant workers was introduced in 1998. This was revoked in 2001 as employers begun to switch to hiring illegal workers and under-reporting migrant wages to reduce EPF contribution. The government is currently considering a proposal to increase the levy by 400 per cent by 2015 (The Star, 19 February 2011) and to introduce security bonds to ensure employers' responsibility for adherence to employment contracts.

There have been periodic retrenchments and deportations of legal workers in times of economic downturns[7]. For example, the Asian Financial Crisis (AFC) in the 1997 led to temporary movement to expel unskilled and undocumented foreign workers in August 1997. Soon after in July 1998, migrant inflows were encouraged to arrest the decline in foreign direct investment (FDI). Similarly, the Global Financial Crisis (GFC) in 2008 once again reversed the preference towards migrants, as policymakers froze their intake in manufacturing in January 2009 amidst the rising number of company closures and ensuing job layoffs. Within a period of six-months, the government reopened the intake of migrant workers in the E&E and textile industries, following appeals by key industry players on cancelled international sales orders due to labour shortfalls. Further, the government had in some cases resorted to encourage the re-migration of illegals as an immediate measure to alleviate labour shortages. In October 2004, undocumented migrant workers

who were deported under a four-month amnesty programme were thereafter allowed to return on official permits.

To control illegal migrant inflows, several amnesty programmes have been launched since 1991. However, these attempts had only limited success, with the exception of the March-July 2002 programme that saw the departure of a total of 570,000 illegal workers. It appeared that shutting legal channels for the recruitment of migrant workers were counter-productive as the inflows of illegal workers continued, largely abetted by corrupt practices of agents, immigration officials, police and employers. The situation worsened when the government enacted a new outsourcing system in 2007, permitting licensed companies to recruit migrant workers. This not only created an outsourcing industry that flourished on rent-seeking behaviour, but in turn spawned a range of abusive practices (NEAC 2010). Responding to this with a freeze on licenses issued to outsourcing companies in 2009, the government has indeed begun to recognize that dilution of control by the state in matters of in-migration is a sure recipe for disaster.

Although Malaysia labour law does not discriminate against foreign workers, there is anecdotal evidence that, in practice, these workers rights are not fully protected. According to estimates by the MTUC, approximately 15-20 per cent of registered foreign workers in the country are being mistreated (ITUC 2010). Malpractices relating to foreign workers include non-payment of wages, deduction of wages to cover the cost of work permits, long working hours, not providing insurance coverage for workplace accidents, barriers to join unions, withholding travel documents, and unfair dismissal. Recently the government made it mandatory for employers to provide migrant workers with health insurance coverage (effective January 2011). This mandate, though it ostensibly benefits foreign workers, was implemented mainly because of the high amount of unsettled public hospital bills by employers, totalling RM18 million as at November 2010.

3. GROWTH, STRUCTURAL CHANGE AND LABOUR MARKET TRANSITION

At the time of independence in 1957, the Malaysian economy showed less resemblance to a labour surplus economy (Athukorala and Manning 1998, Chapter 6). Most Malay peasants operated small family farms and faced difficulties in expanding into larger commercial units owing to labour shortages. While there was evidence of under-utilised labour on a seasonal basis in food crop production, returns to labour were high by regional standards and under-employment was not a major factor contributing to low incomes and productivity. A growing informal sector already existed in larger towns and cities, but there was little sign of chronic labour surplus.

It was only by about the late 1960s that Malaysia began to face a structural problem of excess labour supply (Blake 1975, Snodgrass 1976). Both labour demand and supply factors were at play. On the supply side, Malaysia, like several other countries in East Asia, began to experience a labour force 'explosion' as a result of rapid population growth from around this time. Population growth had accelerated to over 3 per cent per annum by the mid-1950s, after more than a decade of slow expansion. Labour force growth followed suit, accelerating to over 3 per cent by the mid-1960s.

On the labour demand side, the plantation sector, which was the backbone of the economy at the time, was predominantly based on indentured labour from China and India. It played a little role in absorbing native Malays entering the labour force because they were unwilling to take socially 'inferior' wage work. Thus the country faced the dilemma of a large non-indigenous labour force working alongside a swelling labour force of Malays. In non-plantation agriculture, there were major constraints to finding enough new jobs. The smallholder rubber industry was no longer expanding, and increases in productivity could only be supported through labour-displacing technical change. Structural change in estate agriculture was underway, but largely through extension of the more capital-intensive oil palm industry. There were also signs of surplus 'under-utilised' labour in rice agriculture, as this industry expanded slowly and only with considerable government support. Thus whereas a significant share of employment had been absorbed in agriculture (mainly into

rubber) through to the early 1960s, this sector's share of jobs fell steeply to around only 20 per cent from 1962-67 (Snodgrass 1975). Though growth in the number of unemployed was high - in absolute terms - it was only slightly smaller than the (net) number of people who found new jobs in agriculture in the same period. Moreover, the spread of primary and increasingly secondary education to young rural women, in particular, had also begun to fuel search for urban wage employment on a scale never experienced in the past. Thus, increasing numbers of rural Malays were seeking work in cities such as Kuala Lumpur, in response to shortages of jobs (or an aversion to less preferred jobs in agriculture) in their home villages

The industries set up under tariff protection in the 1950s and 1960s were characterised by a 'natural' capital intensity in line with the general experience with import-substitution industrialization in developing countries. Thus, manufacturing absorbed a small proportion (13 per cent by the late 1960s) of the work force and the main burden of non-agricultural jobs had to be shouldered by the services industry whose expansion had been naturally constrained by limited real-sector growth. As a result, recorded unemployment rates rose to around 8 per cent by 1970 with urban unemployment hovering around 10 percent (Snodgrass 1980, p.59). After a drop to around 5 percent in the early 1980s reflecting the impact of short-lived state-led industrial expansion, the unemployment rate continued to increase reaching a peak of 8.3 percent in 1986.

From the late 1980s, export-oriented manufacturing turned out to be the engine of growth in the Malaysian economy (Figures 1 and 2). Between 1987 and 1997, the manufacturing sector grew by an average annual rate of 14 percent, almost double the rate of expansion achieved in the previous ten years. In 1989, for the first time the manufacturing share in GDP overtook that of agriculture. The share of manufacturing in GDP increased from about 20 per cent to nearly 30 per cent during this period, contributing to over 50 per cent of the total increment in GDP. In addition, much of output expansion in the tertiary (service) sectors was closely related to the expansion of the manufacturing sector. Consequently, there was an increasingly close relationship between

manufacturing growth and GDP growth during this period (Figure 2). The share of manufacturing in total labour deployment in the economy increased from 15 per cent in the mid-1980s to 27 per cent in 1997, contributing to nearly two-thirds of the total increment in employment during the period. The manufacturing sector's share in GDP has shown a mild decline during the period after the AFC, but its share in total employment has continued to increase, albeit at a slower rate compared to the previous decade (Figure 1).

The rapid expansion of export-oriented manufacturing, particularly the E&E industries, was accompanied by persistent decline in the unemployment rate. By the mid 1990s the Malaysian economy was at virtual full-employment, with an unemployment rate of only 2.8 per cent. With the approach of full employment with intensification of pressure on domestic wages, Malaysia has begun to attack migrant workers in large numbers from neighbouring labour surplus countries, Indonesia in particular.

4. FOREIGN WORKERS IN MALAYSIAN MANUFACTURING

The number of registered foreign workers increased from around 440 thousand (3.2 per cent of the labour force) in 1990 to over 2 million (21 per cent of the labour force) in 2008, accounting for over a third of the increase in total labour supply in the economy between these two years (Table 2). From about the late 1990s, Malaysia has been the largest labour importer in Asia, both in terms of the absolute number of foreign workers and their share in the domestic labour force (Athukorala 2006, Ducane and Abella 2008).[8]

Until about the mid-1980s, foreign workers in Malaysia were engaged predominantly in the agricultural sector (mainly in plantation agriculture), which faced severe labour shortages as native workers moved to take up employment opportunities in the booming modern sector. Since then, they have gradually penetrated the modern sector of the economy, first to the construction industry and subsequently modern sector services, household services and manufacturing. The share of

documented foreign workers in manufacturing increased from less than 10 per cent in the early 1990s to 36 per cent in 2007, by far the largest share among the major economic sectors in the Malaysian economy (Table 2).[9]

Foreign workers in Malaysia are predominantly from the neighbouring Indonesia. However, over the years the recruitment network has expanded to other countries in the region and beyond (Bangladesh, Philippines, Nepal, Vietnam, Sri Lanka, India, Pakistan, Burma, Thailand, Timor Leste, Uzbekistan, Kazakhstan and Turkmenistan) (Ramasamy 2004).[10] In general, the diversification of source-country composition of labour supply reflects the government's attempt to control the source of inflows on socio-cultural grounds, rather than supply-side factors, in determining labour inflows. Interestingly, the industry/sectoral composition of workers is quite segmented by country of origin: Indonesian workers are heavily concentrated in construction and agriculture; Bangladeshis are predominantly in manufacturing; Filipinos are mainly employed as higher status maids, alongside lower paid Indonesians meeting demand in a different segment of the market; and Vietnamese are mainly in the construction sector.

The number of registered foreign workers employed in Malaysian manufacturing increased from about 8,000 (1.6 per cent of the manufacturing labour force) to over 200,000 (14.5 per cent) by 1995.[11] Following a mild decline during the years of the AFC, the number increased sharply during the ensuing years, 360,000 mark by 2005 (Figure 3). Foreign workers in Malaysian manufacturing are unevenly distributed across industries (Table 3). They are heavily concentrated in export-oriented industries compared to domestic-market oriented industries. During 2000-05, export-oriented industries (defined to cover industries with export-output ratios of more than 50 per cent) accounted for over two-thirds of total foreign workers engaged in Malaysian manufacturing (Table 3). Among export-oriented industries, the degree of dependence on foreign workers is much higher relative to the overall manufacturing average only in the traditional labour-intensive export-oriented industries (wood products, rubber goods, textiles and garments and miscellaneous manufacturing),

and also the E&E industry, which is conventionally classified as a capital intensive/high-tech industry. It seems that the types of jobs taken up by foreign workers (3-D jobs) are not necessarily industry-specific. Even though it is generally believed that jobs in the high-tech industries are clean and highly paid, there are many jobs in these industries that involve long working hours and hard labour and hence shunned by native workers.

Foreign workers are predominantly engaged in low-skill (unskilled and semi-skilled) jobs (Table 4). Over 80 per cent of foreign workers are engaged in low-skill jobs compared to less than half of the native workers. The share of skilled workers among foreign workers has declined across all industries. Nearly 78 per cent of all foreign workers in manufacturing in 1990 were production workers/operatives. This figure then increased to 95 per cent in 2005. The share of foreign production workers in total production workers had similarly increased from 3.5 per cent to 30.3 per cent over the period of review. Interestingly, the low-skilled share in total foreign workers is unfirmly high (over 90 per cent) across all industries (with the exception of petroleum and chemical industries) (Table 3). These patterns reaffirm our earlier observation that migrant worker concentration in unskilled jobs is not industry specific, but a common phenomenon.

An important feature of the process of export-oriented industrialisation in Malaysia is its heavy concurrent reliance on both foreign workers and foreign capital (involvement of multinational enterprises (MNEs). As already noted, export-oriented industries are generally more reliant on foreign workers compared to domestic-market oriented industries. The degree of MNE participation (as measured by the MNE share in output) is also much higher in these industries. In particular, MNE dominated E&E industry, by far the major export-oriented industry in the country, accounted for one fifth of total foreign workers in manufacturing. Why both foreign labour and foreign capital move to Malaysia? Why MNEs do not relocate manufacturing in labour abundant neighbouring countries instead of relying on foreign labour for undertaking production in Malaysia? The answer seems to be that availability of cheap labour, while important, is secondary to the quality of the

overall investment environment in determining a country's attractiveness for FDI. Since the early 1970s, Malaysia's investment climate has remained highly favourable for international production compared to that in all source countries of foreign workers employed in Malaysia.

5. FOREIGN WORKERS AND DOMESTIC MANUFACTURING WAGES

Figure 4 depicts the time patterns of average real wages and foreign worker presence in manufacturing, focussing separately on total workers and low-skill (production) workers. The data are generally consistent with the popular perception that the increased presence of foreign workers has been associated with a slowing down of real wage growth. Real wage of both all manufacturing workers and unskilled workers increased at an annual average rate of 4 per cent during 1992-1999. During 2000-05, when there was a significant continuous increase in the degree of dependence on foreign workers, average total manufacturing wage grew by only 1.95 per cent and the rate of increase in average low-skill wage rate was even lower, 0.92 per cent. The patterns revealed by the scatter plot of real annual wages and shares of foreign workers in total employment of five-digit over the period 2000-2005 (Figure 5) are consistent with those revealed in the time-series comparison. The Pearson rank correlation coefficients between real wages and foreign worker dependency, -0.402 and -0.322 for total workers and unskilled (production) workers respectively, are both statistically significant at the one per cent level.

Thus the first impression from a casual inspection of data is consistent with the widely-held view that foreign worker presence suppress domestic manufacturing wage. But, it is hazardous to read too much meaning into this simple correlation because there are many other factors which impact on inter-industry differentials in wages and wage growth over time at the industry level. Now we turn to a regression analysis that deals with this relationship in greater detail. We first focus on model formulation, followed by a brief discussion on the data and the estimation methods before presenting the results.

The Model

We examine the postulated wage restraining effect of foreign worker presence in manufacturing by estimating the following model.

$$RWG = F(FWD_{it}, RQ_{it}, KL_{it}, SKL_{it}, SIZE_{it}, FOW_{it}, EO_{it}, CNC_{it}, DTUN)$$

(+ or -) (+) (+) (+) (+) (+) (-) (+ or -) (-)

where i = 1, 2, ..., n is the industry, t = 1, 2, …, T is the time unit in years, *RWG* is real wage and *FWD* is the share of foreign workers in total employment (foreign-worker dependence). The control variables are,

RQ	Real output (value added)
KL	Capital intensity
SKL	Skill intensity
SIZE	Average firm size
FOW	Foreign ownership
EO	Export orientation
CNC	Industry concentration (four-firm concentration ratio)
DTUN	'Trade union' dummy, to capture restriction on trade union activity

RQ, *KL* and *SIZE* are measured in natural logarithms, whereas *SKL*, *FOW*, *CNC* and *EO* are percentage shares.

The main variable of interest is foreign worker dependence, *FWD*, which is postulated to have a negative effect on domestic wages. Among the control variables, real output (*RQ*) is included to capture the impact of labour demand associated with output growth on wages. If the labour markets are generally competitive and if each industry faces a roughly similar less than perfectly elastic labour supply curve, then industries wishing to expand output would have to pay higher than average wages.

The choice of capital intensity (*KL*) and establishment size (*SIZE*) as explanatory variables is suggested by the efficiency wage literature (Brown and Medoff 1989, Murphy and Topel 1990). All other things constant, one can postulate that higher capital intensity encourages firms to pay efficient wages, since it is more costly for capital intensive firms to suffer employee shirking or absenteeism. Apart from this efficiency consideration, one can also expect firms in capital intensive industries to concede to higher wage increases because their wage bills would typically account for a relatively small proportion of production cost. Put simply, firms in capital-intensive product lines may not be so cost conscious with respect to wages. By similar reasoning, large firms may pay higher wages than smaller firms, presumably because shirking is harder to monitor in larger firms. The tendency for shirking might be greater in large firms because employees' discontent with the job is likely to correlate positively with the firm size. In addition to *KL*, skill intensity (*SKL*) is included as an explanatory variable to allow for the possibility that industries with a higher proportion of skilled workers in total employment tend to exhibit higher average wages.

Foreign ownership (*FOW*) is included guided by the literature on wage setting behaviour of MNE affiliates in host countries.[12] An empirically-supported consensus view in this literature is that that MNE affiliates have a tendency to pay higher wages than their domestically-owned counterparts. Such difference may reflect MNEs' willingness to pay wages that are more in line with what they pay in their home countries, and/or simply their desire to maintain an image of good corporate citizens in the host country.

Export-oriented firms generally operate under greater demand pressure compared to domestic-market oriented firms which enjoy both policy-induced and natural protection. This may be particularly true for exporting firms in a small exporting economy like Malaysia, given the nature of the export mix (which is dominated by standardised labour intensive consumer goods and component assembly in vertically integrated industries) and the small share in world supply in most

(if not all) of product lines. For these reasons, *EO* is included as an additional explanatory variable in the regression.

Among the other explanatory variables, industry concentration (*CNC*) is included to capture the impact of market power of a given industry on wage growth. The hypothesis is that since greater market power translates into excess profits, firms in monopolistic or oligopolistic industries insulate from market pressure and therefore pursue a policy of paying highly competitive wages. Alternatively, greater market power may translate into greater bargaining power of employers to keep wages down.

A binary 'trade union dummy' (*DTUN*) (1 for industries which come under the standard industry classification of electronics products and parts) is included to capture the impact on inter-industry wage differentials of the prevailing restrictions trade union activity. As parts of an understanding reached in the early 1970s with foreign electronics companies which set up production in the country, the Malaysian government has continued to strictly prohibit workers in these industries becoming members of national trade unions. They are permitted to join only in-house-unions[13] limited to individual firms (Crouch 1996, pp.224-25). It is generally believed that this restriction on trade union activity has constrained wage bargaining power of electronics workers (Koshi 2010). Ideally, we should have included a direct indicator of trade union influence such as the rate of unionization (union membership in total work force) or the number of days lost due to trade union action, encompassing all industries, but unfortunately data are not available.

Data and Variable Construction

Data on manufacturing wages, employment, output, capital and exports were compiled from the electronic data files containing unpublished returns to the *Annual Survey of Manufacturing Industries* (ASMI) conducted by the Department of Statistics (DOS), Malaysia. Price indices used for deflating

current-price output and wage series were from the *Monthly Statistical Bulletin* database of the Bank Negara Malaysia.

The ASMI data are available electronically from 1992, but it is not possible to consistently match the data after 1999 with those for the preceding years at the four- or five-digit level of the standard industry classification because of a major change in the classification system introduced with effect from 2000. Moreover, the data file for the years prior to the introduction of the new revision do not contain data required for the construction of three variables relevant for our analysis (*FOW*, *EO* and *CNC*). For these reasons, we opted to focus primarily on a data panel constructed at the five-digit level covering the six-year period from 2000 to 2005 (the latest year for which data were available at the time of data compilation). However as a rough check on the estimates coming from these data, we also report estimates for the truncated model (that is after deleting *FOW*, *EO* and *CNC* from the full model) for the period 1992-2005 using a panel data set constructed at the 3-digit levels. Both data panels are balanced.[14]

The DOS database provides employment and wage data under five major occupational categories: managerial and professional, technical and supervisory, clerical and related workers, general workers, and production workers and operatives (directly employed and through labour contractors). For the purpose of this study, production workers and operatives (workers who earn less than RM2,500 per month) are defined as unskilled workers whilst the professional and managerial workers are treated as skilled technocrats (with earnings of more than RM2,500 per month).[15] Unskilled foreign workers refer to workers who hold temporary work permits which are renewed annually, although the employment agreements are normally for three years. The wage bill includes both regular wage/salary and all other payments in cash to workers, other than the employer's contribution to provident funds. The definition and measurement of variables used in regression analysis are summarised in Table 5.

Estimation Method

We first estimated the model using fixed-effects (FE) and random-effects (RE) estimators and compared the results using Wu-Hausman test. The test decisively rejected the null hypothesis that unobserved explanatory variables (the unobserved effects) are not distributed independently of the explanatory variables, favouring the use of the FE estimator. However, an obvious limitation of the FE estimator is that it cannot retain *DTUN* (which is time-invariant) in the estimated model. Omission of *DTUN* is unlikely to impact on the coefficient estimates of the other variables, because it is essentially industry specific, but this variable is important for our analysis in its own right. We therefore report results based on both FE and RE estimators, while giving preference to the results based on the former. [16]

The simple FE and RE estimators can yield bias and inconsistent coefficient estimates if one or more explanatory variables are endogenous (that is, if they are jointly determined together with the dependent variable). In our case, there are reasons to suspect that *FWD* in the wage equation is potentially endogenous for a number of reasons. For instance, foreign workers may tend to concentrate in industries where positive demand shocks have led to better labour market conditions and higher wages for both immigrants and native workers. In this case, immigrant inflows are not only driven by labour market changes but labour market changes, in turn, are driven by migrant inflows. The government usually takes into account labour market conditions (including wage trends) faced by individual industries in regulating labour inflows. Moreover, unobserved factors affecting migrant flows (industry lobbying) are likely to simultaneously affect wages. Compared to the RE estimator, the FE estimator has the advantage that it controls for industry-specific fixed factors affecting both these variables. However, the FE estimator would not help addressing the endogeneity problem if there are time-varying omitted variables affecting the dependent variable and correlated with the foreign worker dependency variable.

Given this concern, we re-estimated the model by combining FE and RE estimators each with the instrumental variable (IV) estimator. The instrument used is the lagged foreign worker dependency (FWD_{t-1}). The rationale behind this instrumental variable choice is that variation in past migration affects current-year migration but should have no direct effect on current year wages. It captures persistence in migration. Persistence is indeed a well-known feature in the migratory process; past migration leads to future migration through network effect (Hanson 2010) and also as firms become accustomed to relying on foreign workers (Borjas 1999). Admittedly, this instrument is not perfect: past migration rate could well be correlated with future wages anticipated by firms. However, we fail to detect significant correlation between our instrument and the error term of our second stage regression.

Results

The final FE and RE instrumental variable (IV) estimates of the model for the period 2000-05 are reported in Table 6.[17] Panel unit root tests, summary statistics of the variables and their correlation matrix are reported in Tables 7, 8 and 9 respectively to facilitate interpretation of the results. The alternative simple FE and RE estimates are reported in Appendix Table A-1 for comparison.

As already noted, in interpreting the estimates our prime focus is on the FE estimates. The coefficient of foreign-worker dependence variable (*FWD*) has the negative sign in both total wage equation (Equation 1) and unskilled-worker wage equation (Equation 3). It is however statistically insignificant in the former, but highly significant in the latter. Overall, the results are consistent with the general perception that the presence of foreign workers suppresses real wages, but the magnitude of the wage suppression effect seems rather small. In relation to unskilled-worker wages for with the relationship is more precisely estimated, the result suggests only a 1.9 per cent decline in real wages for a 10 per cent increase in the degree of foreign worker dependency.[18] In both cases, the FE and RE estimates of the coefficient of foreign worker dependence variable overlap within the two-standard

error band, but the difference in magnitude between the two estimates is not large, suggesting that our inference is not sensitive to the choice of estimation method.

One could reasonably question whether the estimated coefficient of *FWD* is affected by multicollinearity: in particular, it is possible that *FWD* is (negatively) correlated with capital intensity given the tendency for foreign workers to concentrate in labour intensive industries. But, the estimated correlation coefficient between *FWD* and *KL* is only -0.28 for all workers and -0.22 for unskilled workers (Table 8).[19] *FWD* is also only weakly correlated with all other explanatory variables in both cases. To be sure, we also estimated the equation after omitting *KL* and found the coefficient of *FWD* is robust to this alternative specification.[20]

Among the control variables, the coefficients of *RQ*, *KL*, *SKL*, *SIZE* are highly significant (at 1 percent level or 5 per cent level) with expected signs in both total workers and unskilled worker equations, and the results are remarkably robust to the method of estimation. The estimated degree of elasticity of real wage with respect to each of these variables is much larger compared to that with respect to *FWD*. Thus there is strong statistical support for the proposition that factors closely related to manufacturing performance and industrial structure are much more important compared to foreign worker dependence in explaining real wage behavior.

The coefficient of *EO* bears the expected (negative) sign but is not statistically significant in both FE-IV equations, providing no statistical support for the hypothesis that greater export orientation is associated with lower wages. At the same time, there is only weak statistical support for the hypothesis that foreign firms tend to pay higher wages compared to their local counterparts. The coefficient of *FOW* has the expected sign in both FE-IV regressions but is statistically significant (at 10 per cent level) only in the wage equation for all workers. The result for this variable is also highly sensitive to the choice between instrumented FE and RE estimators. The results for the impact of industrial concentration on real wages are also mixed.

The coefficient of *DTUN* in both RE-IV equations (Equations 2 and 4)[21] is significant at the 5 per cent level with the expected (negative) sign. The estimates suggest that workers in industries where national trade unions are prohibited on average earn 11.3 per cent less than their counterparts in other industries.[22] The impact is even larger for unskilled worker wages, 21.7 per cent. These results, although they are very much in line with the generally expected impact of trade union pressure on wage setting, need to be treated with caution because the Malaysian policy of national union membership prohibition is applicable solely to the electronics industry. The estimates presumably capture not only the impact of labor law but also some structural peculators of this industry, to the extent the latter are not appropriately captured in the other control variables in the model. This is certainly an important issue which deserves further scrutiny.

Finally, we turn to the estimates based on the truncated model (that is after dropping *FOW, EO* and *CNC*) estimated using three-digit data over the period 1992-2005 (Table 10). Estimates are reported for the entire period as well as for two sub-periods, 1992-99 and 2000-05 to facilitate comparison. The coefficient of *FWD* in the alternative estimate for period 2000-2005 is remarkably similar to our earlier result from the full model estimated using five-digit level data. Both coefficients suggest a highly significant negative effect of foreign worker dependence on real wages, and they overlap within a two standard error band. However, the coefficient estimate for the full period suggests a highly significant complementary (positive) relationship between foreign worker dependence and real wages for all workers. The estimates for the two sub-periods indicate that this complementary relationship for the overall period is the net outcome of a strong positive effect in the first sub period that overwhelmed the negative effect in the latter period. During 1992-99, a 10 per cent increase in foreign worker dependency was associated with 0.8 per cent increase in wages of all manufacturing workers and 0.4 per cent increase in wages of unskilled workers. These estimates are generally consistent with the prevailing view in Malaysian policy circles that foreign workers, who were mostly complementary to local employment to begin with, have begun to compete with local

workers with the passage of time, as domestic labour market tightened and the presence of migrant workers because a 'permanent' feature of the economic landscape of the country. However, the estimates need to be treated cautiously because of the possible aggregation bias involved in the use of data at the three-digit level. In any case, from policy point of view, what is more important is the magnitude of the estimated relationship, which is rather small compared to the estimated impact of industry structure and performance variables.

6. CONCLUDING REMARKS

With the rapid growth of labour inflows from less-developed to rapidly-growing countries within the developing world, whether increased presence of foreign workers constrains domestic wage growth with adverse implications for growth and structural transformation in the domestic economy has become a major concern in economic policy debate in the latter countries. In this paper, we have attempted to inform this debate through a case study of Malaysia, which has emerged over the past one-and-a-half decades as the major host to foreign workers in Asia.

We do find a statistically significant negative impact of foreign worker dependency on real manufacturing wages, but the magnitude of the impact is small. Real manufacturing wages seem fundamentally embedded in the structure and performance of domestic manufacturing, with the influx of foreign workers having an impact only at the margin. Our results caution against putting the blame for slow wage growth mainly (in not solely) on foreign workers, as has been done, for example, in an influential policy report (NEAC 2010), without probing the issue in the wider context of the industrialization process, the underlying policy framework and the resultant incentive structure. The long standing labour market regime that has cushioned specific industries against wage bargaining within the national trade unions may also have played a role.

In this paper we have solely examined the impact of foreign workers presence on manufacturing wages treating the contemporary policy concern that foreign workers thwarts capital

deepening and industrial upgrading through wage suppression at face value. Further research need to focus specifically on the nexus of wage and technological change. As Kindleberger (1967, p.203) has aptly put it in an important early study of the impact of migrant workers on European growth, this is an issue 'in which our ignorance is profound'.

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[1] For surveys of this literature, see Borjas (1999), Ottaviano and Peri (2006), Zimmermann et al. (2007).
[2] The Ministry of Human Resources is currently considering introducing a single wage for both local and foreign workers (set at two different levels for Peninsular Malaysia, and Sabah and Sarawak) (The Star, 14 February 2011).
[3] Figures reported in this paragraph unless otherwise stated come from, Department of Statistics, *Statistical Yearbook*, Kuala Lumpur.
[4] The Wages Council at present covers four areas: Wages Regulation (Catering and Hotel) Order 1967, Wages Regulation (Shop Assistants) Order 1970, Wages Regulation (Cinema Workers) Order 1972 and Wages Regulation (Penang Stevedores and Cargo Handlers) Order 1967.
[5] Contributions on a voluntary basis can be made by those who are self-employed, domestic servants and foreign workers. In the case of foreign workers, the employee contributes 11 of the monthly wage whilst the employer contributes RM5 to the Fund.
[6] SOCSO does not cover foreign workers, who are protected under the Workmen's Compensation Act 1952.
[7] The Malaysian government follows a policy of 'foreign workers first out (FWFO)' under which employers are required to lay off foreign workers before they retrench locals (Employment Act, 1955).
[8] The official figures understate the foreign-worker dependence of the Malaysian economy: alongside formal labour migration has grown a vast network of clandestine (undocumented) migration. The exact size of the clandestine migrant labour force is unknown; estimates run from half a million to a million.
[9] These figures perhaps overstate the relative degree of foreign worker dependence of manufacturing because clandestine workers are heavily concentrated in other sectors, in particular agriculture and construction.
[10] Indonesians still account for the lion's share in the foreign labour force in Malaysia (over 57 per cent in 2009) (Ministry of Finance 2010).
[11] Figures given here relate to foreign workers employed in organized manufacturing. According to survey-based evidence, the incidence of clandestine worker presence in organized manufacturing is negligible compared to other sectors in the economy, in particular agriculture, construction and non-household services.
[12] Lipsey (2004) provides a comprehensive survey of this literature.
[13] The Government still rejects a national union for the electronics industry, but now allows for unions at the regional level, thereby granting more than 250,000 workers from this sector to be unionized. The Department of Trade Union Affairs has to date registered three regional electronics employees unions in the Peninsula: the Western Region on Dec 1, 2009 (covering Kuala Lumpur, Selangor and Perak); the Southern Region on March 11, 2009 (Johor, Malacca and Negri Sembilan); and Northern Region on March 31, 2009 (Penang, Kedah and Perlis). The Eastern Region, which covers Kelantan, Terengganu and Pahang, is still in the process of registration (The Star, 2 May 2010).
[14] Ideally we should have worked with plant-level data, but unfortunately DOS does not release data at that level; company ownership is a highly sensitive issue in multi-ethnic Malaysia.
[15] This is the standard definition used by DOS, but according to some media reports the average wage of unskilled workers could be much lower, between RM1800 to RM2000. In preliminary analysis, we used both RM1800 and RM2000 as alternative cut-off points and found the econometric estimates to be remarkably resilient.
[16] RE-based results are also useful as a check on the FE-based results because the FE estimator is highly sensitive to measurement errors because as part of the 'demeaning' process it removes a significant portion of variation in the right-hand-side variables (Angrist and Pischke 2009).
[17] The model was estimated with time dummies added to capture time-specific fixed effects. In all cases, the dot.com dummy (*DCD*) could not be retained because it was highly correlated with the time dummy.
[18] Note that *RWG* is in log form but *FWD* is measured as a percentage share. Thus the elasticity of *RWG* with respect to *FWD* is 'the coefficient of *FWD* times the mean value of *FWD*.'
[19] To be sure, we estimated the model after deleting *KL* and found that the estimated coefficient of *FWD* is remarkably resilient.
[20] Alternative estimates (not reported here for want of space) are available from the authors on request.
[21] As already noted, the effect of this variable is captured as part of industry-specific fixed effects in the FE estimation.
[22] Note that, as the dependent variable is in natural logarithms, the proportionate equivalent for any dummy coefficient need to be calculated as, [exp (dummy coefficient) – 1]* 100.

Appendix

Table A-1: Determinates of Inter-Industry Wage Differences: FE and RE Estimates, 2000-2005[1]

(Dependent variable: log of real average annual wage, *RWG*)

	All Workers		Unskilled Workers	
	FE	RE	FE	RE
	(1)	(2)	(3)	(4)
Constant term	6.689***	6.703***	6.249***	6.488***
	(0.507)	(0.225)	(0.770)	(0.288)
Foreign worker dependence (*FWD*)	-0.001	-0.003***	-0.002**	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Real output (*RQ*)	0.045**	0.035***	0.061*	0.043***
	(0.023)	(0.010)	(0.032)	(0.012)
Capital intensity (*KL*)	0.129***	0.145***	0.115***	0.122***
	(0.030)	(0.019)	(0.039)	(0.024)
Skill intensity (*SKL*)	0.008	0.014***	-0.006	0.002
	0.005	(0.004)	(0.006)	(0.004)
Average firm size (*SIZE*)	0.019	0.031**	0.042	0.039**
	(0.032)	(0.015)	(0.035)	(0.018)
Foreign ownership (*FOW*)	0.002**	0.001**	0.002*	0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Export orientation (*EO*)	0.000	-0.001	-0.0003	-0.001*
	(0.001)	0.001	(0.001)	(0.0005)
Industry concentration (*CNC*)	-0.0004	0.001	-0.002	0.001
	(0.001)	(0.001)	(0.002)	(0.001)
Trade union dummy (*DTUN*)		-0.095*		-0.203***
		(0.056)		(0.078)
Time dummies	Yes	Yes	Yes	Yes
F-statistics	19.96		4.98	
Wald χ^2		483.57		203.27
R^2	0.531	0.634	0.217	0.395
No. of observations	1020	1020	1020	1020
No. of groups	170	170	170	170
Breusch-Pagan LM test[2]		χ^2 (1) = 1301.73		χ^2 (1) = 1242.02
Wu-Hausman test[2]	χ^2 (12) = 215.83		χ^2 (12) = 90.92	

Notes: 1. Standard errors adjusted for arbitrary heteroskedasticity and intra-group correlation are given in brackets, with statistical significance denoted as *** 1%, ** 5% and * 10%.

2. Null hypothesis is rejected at the one percent level

References

Angrist, Joshua D. and JÖrn-Steffen Pischke (2008). *Mostly Harmless Econometrics: An Empiricist's Companion* (NJ: Princeton University Press).

Athukorala, Prema-chandra (2006). International labour migration in East Asia: trends, patterns and policy issues, *Asian Pacific Economic Literature*, 20(1): 18-39.

Athukorala, Prema-chandra and Chris Manning (1999). International labour migration: a third dimension of East Asian growth, in *Structural Change and International Migration in East Asia: Adjusting to Labour Scarcity* (London: Routledge), pp.1-10.

Athukorala, Prema-chandra and Jayant Menon (1999). Outward orientation and economic performance: the Malaysian experience, *World Economy*, 22(8): 1119-39.

Bank Negara Malaysia, BNM (2010). *Annual Report 2009* (Kuala Lumpur: Bank Negara Malaysia).

Blake, D.J. (1975). Unemployment: the West Malaysian example, in David Lim (ed.), *Readings on Malaysian Economic Development* (Kuala Lumpur: Oxford University Press), pp.186-194.

Borjas, George J. (1999). The economic analysis of immigration, in Orley C. Ashenfelter and David Card (eds.), *Handbook of Labour Economics*, Volume 3, Part 1 (Amsterdam: North Holland), pp.1697-1760.

Brown, Charles and James Medoff J. (1989). The employer size-wage effect, *Journal of Political Economy*, 97(4): 1027-59.

Campos, Jose E. and Hilton L. Root (1996). *The Key to the Asian Miracle: Making Shared Growth Credible* (Washington D.C.: Brookings Institution).

Crouch, Harold (1996). *Government & Society in Malaysia* (Ithaca: Cornell University Press).

Ducanes, G. and M. Abella (2008). Labour shortage responses in Japan, Korea, Singapore, Hong Kong and Malaysia: a review and evaluation, ILO Asian Regional Programme on Governance of Labour Migration, Working Paper No.2, International Labour Organization (ILO): Geneva.

Hugo, Graeme (2004). International labour migration in the Asia-Pacific region: emerging trends and issues, in D.S. Massey and J.E. Taylor (eds.), *International Migration: Prospects and Policies in a Global Market* (New York: Oxford University Press), pp.77–103.

Im, Kyung So, M. Hashem Pesaran and Yongcheol Shin (2003). Testing for unit roots in heterogenous panels, *Journal of Econometrics*, 115(1): 53-74.

International Trade Union Confederation (ITUC) 2010. Internationally recognized core labour standards in Malaysia, Report for the WTO General Council Review of the Trade Policies of Malaysia, Geneva, January 18-20.

Jones, Gavin W. (2011). Demographic and labour force dynamics, in Hal Hill, Ragayah Haji Mat Zin and Tham Siew Yean (eds.), *Graduating from the Middle: Malaysia's Development Challenges* (London: Routledge) (forthcoming).

Kanapathy, Vijayakumari (2004). International migration and labour market developments in Asia: economic recovery, the labour market and migrant workers in Malaysia, Paper presented at the 2004 Workshop on International Migration and Labour Markets in Asia, Tokyo, February 5-6.

Kindleberger, Charles P. (1967). *Europe's Postwar Growth*: *The Role of Labour Supply*, (Cambridge, Massachusetts.: Harvard University Press).

Koshy, Shaila (2010). Four regional unions for electronics workers soon, *The Nation* (Kuala Lumpur), May 2.

Lee, Joseph (2002). The role of low-skilled foreign workers in Taiwan's economic development, *Asia Pacific Business Review*, 8(4): 41-66.

Levin, A., C.F. Lin, and C.J. Chu (2002). Unit root tests in panel data: asymptotic and finite-sample properties, *Journal of Econometrics*, 108(1):1-24.

Lipsey, Robert E. (2004). Home and host country effects of FDI, in Robert E. Baldwin and L. Alan Winters (eds.), *Challenges to Globalization*: *Analyzing the Economics* (Chicago: Chicago University Press), pp.333-382.

Ministry of Finance (2010). *Economic Report 2009* (Kuala Lumpur: Government Printers).

Murphy, Kevin M. and Robert H. Topel (1990). Efficiency wages reconsidered: theory and evidence, in Yaram Weiss and Gideon Fishelson (eds.), *Advances in Theory and Measurement of Unemployment* (London: Macmillan).

National Economic Advisory Council (NEAC) (2010). *New Economic Model for Malaysia* (Kuala Lumpur: National Printers of Malaysia Ltd.).

OECD (Organisation of Economic Cooperation and Development) (2009). *International Migration Outlook 2008* (Paris: OECD).

Ottaviano, Peri and G. Peri (2006). Rethinking the effects of immigration on wages, NBER Working Paper No.12497, National Bureau of Economic Research: Cambridge.

Piore, Michael J. (1979). *Birds on Passage: Migrant labour and Industrial Societies* (Cambridge: Cambridge University Press).

Ramasamy, P. (2004). International migration and conflict: foreign labour in Malaysia, in Aris Ananta and Evi Nurvidya Arifin (eds.), *International Migration in Southeast Asia* (Singapore: Institute of Southeast Asian Studies).

Snodgrass, Donald R. (1976). Growth and utilisation of Malaysian labour supply, *The Philippine Economic Journal*, 15(1&2): 273-313.

Snodgrass, Donald R. (1980). *Inequality and Economic Development in Malaysia* (Kuala Lumpur: Oxford University Press).

Zimmermann, Klaus F., Holger Bonin, Rene Fahr and Holger Hinte (2007). *Immigration Policy and Labour Market* (Berlin: Springer).

Table 1: Chronology of Policies Related to Migrant Workers, 1980-2010

Year	Policy/ Regulation
1982	Formation of Committee for the Recruitment of Foreign Workers.
1984	Medan Agreement with Indonesia – for agri-plantation and domestic workers.
1985-86	Signing of the MoU between Malaysia and the Philippines – for domestic workers; Permission given for employers to recruit workers from Bangladesh and Thailand for the plantation and construction sectors.
1987	Legalized the use of Indonesian workers in the plantation sector.
1989	Regularization programme.
Jan-90	Freeze on labor importation from Indonesia.
1991	Formation of Cabinet Committee on Foreign Workers.
Oct-91	Introduction of an annual migrant-worker levy, which varies by sector and skill category (general, semi skilled and unskilled). Agriculture (RM360, RM540 and RM720); Construction (RM420, RM600 and RM900); Manufacturing (RM420, RM600 and RM900); Services (RM360, RM540 and RM720).
Dec-91	Launching of Ops Nyah I (Operation Expunge I - to stop illegal infiltration).
Jun-92	Launching of Ops Nyah II (Operation Expunge II - to weed out illegal immigrants).
Jul-92	Permission given for employers to recruit workers from Indonesia, Thailand, Philippines, Bangladesh and Pakistan for manufacturing and services sectors.
Apr-93 –Jan-94	Ban on unskilled worker recruitment. Ban lifted for manufacturing sector. Ban re-implemented on unskilled and semi-skilled workers for all sectors.
Oct-95	Special Task Force on Foreign Labor (the sole agency for recruitment - a one-stop-agency to deal with the processing of immigrants).
Dec-95	All levies increased by 100% except for agriculture and domestic service. It was raised to RM1200 for construction and manufacturing and RM720 for services.
Jan-96	Freeze on the importation of skilled and unskilled labor except for critical sectors in manufacturing and recreation/ tourist industries.
Apr-96	Hari Raya Amnesty for Indonesian illegal workers.
Aug-96 – Jan-97	Freeze on labor importation (employers were instructed to recruit directly from the immigration detention depots) – eventually cancelled the exercise due to the lukewarm response from employers.
Mac-97	Task Force disbanded – functions taken over by the Foreign Workers Division of the Immigration Department.
Aug-97	Ban on new recruitment on migrant workers due to the AFC. Second regularization exercise for illegal migrants from Indonesia, Thailand, the Philippines, Bangladesh and Pakistan.
Jan-98	Annual levy per worker raised to RM1500 for the construction, manufacturing and services sector. It was maintained at RM360 for the plantation and domestic services sector. Mandatory contribution to EPF (12% and 11% of monthly wages by employers and employees respectively).
Jul-98	Ban on the renewal of work permits for the services sector lifted.
Oct-98	Ban on new recruitment lifted – 120,000 new work permits approved for migrant workers in plantation and construction sectors.
Nov-Dec-98	Freeze on the importation of migrant workers lifted.
Feb-99	Levies are lowered for all categories (from RM1500 to RM1200), except domestic workers. New hirings of mostly Indonesian workers.
Oct-99	Recruitment of Sri Lankans in the manufacturing sector.
2001	Mandatory contribution to EPF revoked.
May-01	Ban on intake of Bangladeshis – following clashes with locals.
Oct-01	Maximum limit of temporary work pass limited from 5 years to 3 years.

Table 1 contd.

Year	Policy/ Regulation
Feb-02	Maximum work permit extended to a 3+1+1 ruling (except for domestic services). Ban on new recruitment of Indonesian workers in all sectors, except for domestic services.
Mac-Jul-02	Amnesty programme.
Jul-02	Recruitment of Cambodians in the agri-plantation, manufacturing and construction sectors.
Jan-03	Restrictions lifted on Indonesian workers in the manufacturing and construction sectors.
Apr-03	Freeze on hiring of migrant workers from SARs related countries.
Sept-03	Signing of MoU between Malaysia and China – for workers in ceramics and furniture. Amendment to Immigration Act 2002 – higher penalty for illegal immigration.
Oct-03	Mandatory whipping of up to six strokes of the cane for irregular migrants and their employers.
Dec-03	Signing of the MoU between Malaysia and Vietnam.
Mac-04	New requirement – migrant workers to attend classes on Malaysian language and culture.
Oct-04	Illegal workers allowed to return on official permits.
2005	Permission granted to migrant workers whose contracts have expired to change employers within the same economic sector as long as their work permits are still valid.
Mac-05	Signing of the MoU between Malaysia and Pakistan.
Aug-05	(i) RELA, or the People's Volunteer Corps given power to arrest unauthorized migrants until mid-2009 - provided opportunities for extortion. (ii) Levies are revised: RM1200 (RM960) for manufacturing and construction in Peninsular (East Malaysia); RM540 for plantations; and RM1800 (RM1440) for non-domestic services in Peninsular (East Malaysia).
2006	(i) Ministry of Home Affairs licensed 270 outsourcing companies to recruit mainly South Asian migrants. (ii) Electronic Labour Exchange (ELX) created at the MOHR – mandatory for employers in plantation, construction, manufacturing and services to advertise vacancies in the ELX before they can apply to bring in migrant workers.
Nov-06	Signing of the MoU between Malaysia and Indonesia – Malaysian employers are asked to pay RM2,415 to a local agent while the domestic worker has to pay her Indonesia-based agent RM1,228.
2007	New outsourcing system that does not attach workers permits to a particular employer – dilutes the control of the government.
Jul-07	Major operation to round up an estimated 500,000 irregular migrants.
Oct-07	Ban on the recruitment of Bangladeshi workers because of problems arising from agents (both recruiting agencies in their home country and outsourcing companies in Malaysia).
Jan-08	Unskilled migrant workers will not have their work permits extended if they have been in the country for five years or more.
2009	Freeze on the issuance of new licenses for labour outsourcing companies.
Jan-09	Freeze on labour importation to the manufacturing sector.
Apr-09	Cost of levy to be borne by employers, instead of workers.
Oct-09	Protests by migrant workers that employers continued deducting wages to cover the levy charges.
Jul-09	Freeze on the importation of migrant workers lifted for specific industries.
Nov-10	Compulsory medical insurance policy for migrant workers (excluding domestic maids) effective Jan 2011 - annual premium of RM120 per worker.

Sources: Chin (2002), Kanapathy (2004) and updated using official publications and press releases.

Table 2: Malaysia: Distribution of Foreign Workers by Key Sectors (in %)

Sector	1985	1990	2000	2005	2008
Agriculture[1]	50.1	37.7	24.8	26.0	25.0
Manufacturing	6.9	8.8	38.1	32.1	36.0
Construction	15.0	34.4	8.5	15.5	14.0
Non-Domestic Services	20.3[2]	19.1	6.7	8.8	9.0
Domestic Services	---	---	22.0	17.6	16.0
TOTAL %	95.3	99.5	100.0	100.0	100.0
Number '000	212	440	807	1815	2020

Notes: 1 Includes forestry, fishing and mining 2 Includes domestic services --- Not available

Source: Athukorala and Manning (1999), Athukorala (2006) and Jones (2011) (based on unpublished official sources).

Table 3: Malaysian Manufacturing: Key Indicators of the Structure and Foreign-Worker Dependence (2000-05)[1], (in %)

MSIC Code	Industry	Structure					Foreign workers		
		Output composition	Export composition	Export orientation[2]	Composition of MNE output[3]	MNE share in output[2]	Distribution by industry	Share in total employment	Unskilled share
151-4	Food	7.6	5.8	22.0	4.2	17.8	6.2	13.0	65.6
155	Beverages	1.4	0.1	4.2	0.6	55.5	0.1	4.0	64.9
160	Tobacco	0.6	0.2	24.4	0.2	27.7	0.1	2.3	77.2
171-3	Textiles	1.8	1.7	55.4	1.7	60.6	4.4	26.4	66.6
181-2	Garments	1.6	1.3	54.2	0.8	37.6	8.6	29.6	79.9
191	Leather	0.1	0.1	54.3	0	54.5	0.2	18.0	80.5
192	Footwear	0.1	0	16.1	0	29.5	0.3	16.8	79.1
201-2	Wood & Wood Products	3.5	3.1	52.5	0.9	16.1	19.0	41.0	82.4
361	Furniture & Fixtures	2.0	1.5	44.8	0.6	19.5	10.2	36.5	81.3
210, 221-3	Paper & Publishing	3.9	0.7	12.9	0.7	14.9	2.6	9.5	59.5
241-3	Chemicals	10.1	5.3	32.2	8.3	56.0	1.1	5.5	49.7
232	Petroleum	9.2	8.4	39.8	5.6	29.7	0.1	3.2	37.3
251	Rubber	3.0	2.9	50.4	1.8	35.8	5.6	19.9	77.8
252	Plastic	4.6	2.3	34.1	2.2	37.0	7.2	18.8	71.1
261	Glass	1.4	0.6	41.5	0.9	65.7	0.5	11.7	70.5
269	Non-Metallic Mineral	3.3	0.5	11.2	0.6	16.0	2.7	14.3	65.6
271-3	Basic Metal	3.5	1.6	18.1	1.8	22.7	2.1	12.7	63.9
281, 289	Fabricated Metal	3.4	1.5	25.1	1.7	32.3	3.9	14.8	69.2
291-3	Machinery	3.2	2.1	36.4	2.9	56.4	2.0	9.9	67.1
300, 311-5, 319, 321-3	Electronics & Electrical	30.9	57.7	68.8	60.8	80.7	19.3	11.5	70.7

MSIC Code	Industry	Structure					Foreign workers		
		Output composition	Export composition	Export orientation[2]	Composition of MNE output[3]	MNE share in output[2]	Distribution by industry	Share in total employment	Unskilled share
341-3, 351, 353, 359	Transport Equipment	3.0	1.0	8.1	1.2	11.8	2.1	10.5	69.8
331-2	Scientific/Measuring Equipment	1.0	1.0	52.9	1.6	89.9	0.8	9.9	70.8
369	Miscellaneous Manufacturing	0.8	0.5	38.7	0.5	39.1	1.2	13.2	74.9
	Total Manufacturing	100	100	44.5	100	49.5	100	17.2	70.6

Notes: (1) Annual average (2) Exports as a percentage of gross output (3) Covers firms with a foreign (MNE) equity ownership share of 50% or more (these firms provides an almost full coverage of MNE presence in Malaysian manufacturing because foreign equity restriction apply only to a few domestic-market oriented industries. (4) MSIC refers to the Category D (manufacturing) of the Malaysia Standard Industrial Classification (2000).

Source: Compiled from unpublished returns to the *Annual Survey of Manufacturing Industries* conducted by the Department of Statistics, Malaysia.

Table 4: Occupational Composition of Foreign Workers in Malaysian Manufacturing (in %)

Occupational Category[1]		1985	1990	1995	2000	2005
Professional & Managerial		18.2	15.7	3.4	2.3	1.5
Technical & Supervisory		3.6	3.0	1.2	1.3	1.2
Clerical & Related Occupations		1.5	0.8	0.2	0.2	0.5
General Workers		3.7	2.8	0.9	1.5	2.3
Unskilled (Production) Workers		73.1	77.8	94.4	94.8	94.8
Total	%	100	100	100	100	100
	Number	7517	16377	141930	217262	363029

Note: Based on the International Labour Organisation (ILO) occupational classification.

Source: Compiled from unpublished returns to the *Annual Survey of Manufacturing Industries* conducted by the Department of Statistics, Malaysia.

Table 5: Definition and Measurement of Variables

Variable		Measurement
RWG	Real wage	Average annual earnings per full-time worker (wage/salary plus other payments in cash excluding employer's contribution to provident funds) deflated by the consumer price index.
FWD	Foreign worker dependency	Share of foreign workers in total full-time employment
RQ	Real output (value added)	Nominal value-added (gross output at ex-factory price – cost of intermediate inputs) deflated by producer price index (available only at the two-digit level). The same two-digit price index is used for the five-digit industries falling under that category.
KL	Capital intensity	Real fixed assets (nominal fixed assets deflated by the implicit deflator for gross fixed capital formation) divided by full-time employees.
SKL	Skill intensity	Share of professional and managerial workers in total full-time employment
SIZE	Average firm size	Number of employees per firm
FOW	Foreign ownership	The share of foreign firms (affiliates of MNEs) defined as firms with 50 per cent or more foreign equity ownership to total gross output
EO	Export orientation	The share of exports in gross output.
CNC	Industry concentration	The share of the four largest plants in total gross output in a given industry
DTUN	Trade union dummy	1 for industries in which national trade union membership is prohibited (electronics products and components) and zero for other industries

Table 6: Determinates of Inter-Industry Wage Differences: FE-IV and RE-IV Estimates, 2000-2005

(Dependent variable: log of real annual average wage, *RWG*)

Regressors	All Workers		Unskilled Workers	
	FE	RE	FE	RE
	(1)	(2)	(3)	(4)
Constant term	6.647***	6.786***	6.167***	6.727***
	(0.234)	(0.164)	(0.327)	(0.202)
Foreign worker dependence (*FWD*)	-0.004	-0.007***	-0.010***	-0.008***
	(0.003)	(0.002)	(0.004)	(0.002)
Real output (*RQ*)	0.041***	0.032***	0.057***	0.038***
	(0.010)	(0.008)	(0.015)	(0.010)
Capital intensity (*KL*)	0.146***	0.147***	0.131***	0.114***
	(0.016)	(0.014)	(0.023)	(0.017)
Skill intensity (*SKL*)	0.005**	0.011***	-0.006**	0.002
	(0.002)	(0.002)	(0.003)	(0.003)
Average firm size (*SIZE*)	0.039**	0.045***	0.094***	0.064***
	(0.016)	(0.012)	(0.024)	(0.015)
Foreign ownership (*FOW*)	0.001*	0.001*	0.001	0.0005
	(0.001)	(0.001)	(0.001)	(0.001)
Export orientation (*EO*)	0.000	-0.0004	-0.0002	-0.001
	(0.0004)	(0.0004)	(0.001)	(0.0007)
Industry concentration (*CNC*)	0.001	0.001**	-0.000	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Trade union dummy (*DTUN*)		-0.120**		-0.244***
		(0.053)		(0.064)
Time dummies	Yes	Yes	Yes	Yes
Wald χ^2	1.28e+07	561.15	5.84+06	249.64
R^2	0.553	0.639	0.295	0.410
No. of observations	850	850	850	850
No. of groups	170	170	170	170
Wu-Hausman test [2]	$\chi^2(12) = 766.91$		$\chi^2(12) = 52.13$	

Notes: 1. Standard errors adjusted for arbitrary heteroskedasticity and intra-group correlation are given in brackets, with statistical significance denoted as *** 1%, ** 5% and * 10%.

2. Null hypothesis is rejected at the one percent level.

Table 7: Panel Unit Root Tests (in levels)

Variables	LLC	IPS
RWG:TEMP	-140.28***	-12.08***
RWG:TUKW	-92.59***	-5.54***
FWD: TEMP	-25.40***	-3.03***
FWD: TUKW	-25.11***	-3.07***
RQ	-45.24***	-3.01***
KL	-48.78***	-9.63***
SKL	-27.48***	-2.94***
SIZE	-30.52***	-3.50***
CNC	-199.31***	-21.73***
FOW	-94.84***	-14.49***
EO	-133.34***	-10.62***

Notes: (1) LLC : Test developed by Levin, Lin and Chu (2002); IPS: Test developed by Im, Pesaran and Shin (2003).
(2) One lag is used in all cases.
(3) TEMP: total employment; TUKW: total unskilled workers; other notations as defined in Table 5.
*** signify that the variables are stationary in levels.

Table 8: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
RWG: TEMP	9.1	0.3	8.1	10.2
RWG: TUKW	8.7	0.3	7.7	9.8
FWD: TEMP	14.0	10.1	0.0	76.2
FWD: TUKW	18.9	13.0	0.0	82.2
RQ	18.5	1.6	13.5	22.9
KL	10.6	0.9	8.5	14.7
SKL	7.4	3.8	0.5	31.3
SIZE	4.2	1.0	0.6	7.2
CNC	31.1	20.5	6.6	97.6
FOW	35.5	22.6	0.0	99.2
EO	29.6	19.0	0.0	92.9

Notes: (1) TEMP: total employment; TUKW: total unskilled workers
(2) Other notations as defined in Table 5.

Table 9: Correlation Matrix

	RWG: TEMP	RWG: TUKW	FWD: TEMP	FWD: TUKW	RQ	KL	SKL	SIZE	CNC	FOW
RWG: TUKW	0.91									
FWD: TEMP	-0.41	-0.33								
FWD: TUKW	-0.34	-0.30	0.97							
RQ	0.37	0.33	0.04	0.05						
KL	0.68	0.55	-0.28	-0.22	0.40					
SKL	0.71	0.55	-0.42	-0.35	0.13	0.59				
SIZE	0.26	0.22	0.11	0.10	0.54	0.23	-0.03			
CNC	0.23	0.23	-0.14	-0.15	0.11	0.06	0.08	0.31		
FOW	0.14	0.08	-0.04	-0.05	0.20	-0.03	0.10	0.36	0.48	
EO	-0.19	-0.17	0.22	0.17	0.19	-0.19	-0.17	0.31	0.10	0.57

Notes: (1) TEMP: total employment; TUKW: total unskilled workers
(2) Other notations as defined in Table 5.

Table 10: Determinates of Inter-Industry Wage Differences: FE-IV and RE-IV Estimates, 1992-2005[1]

(Dependent variable: annual average log of real average annual wage, *RWG*)

(a) 1992-2005

Regressors	All Workers		Unskilled Workers	
	FE	RE	FE	RE
	(1)	(2)	(3)	(4)
Constant term	7.995***	7.531***	7.685***	7.561***
	(0.421)	(0.278)	(0.525)	(0.394)
Migrant worker dependence (*FWD*)	0.003**	0.001	0.000	-0.0003
	(0.002)	(0.001)	(0.002)	(0.002)
Real output (*RQ*)	0.003	-0.003	0.0002	-0.003
	(0.019)	(0.013)	(0.024)	(0.019)
Capital intensity (*KL*)	0.060**	0.109***	0.048	0.063**
	(0.028)	(0.021)	(0.034)	(0.028)
Skill intensity (*SKL*)	0.040***	0.043***	0.033***	0.034***
	(0.006)	(0.005)	(0.007)	(0.006)
Average firm size (*SIZE*)	-0.013	0.001	0.026	0.030
	(0.020)	(0.018)	(0.025)	(0.023)
Trade union dummy (*DTUN*)		0.089		-0.051
		(0.107)		(0.177)
Time dummies	Yes	Yes	Yes	Yes
F-statistics	32.49		18.48	
Wald χ^2	3.76e+06	768.01	2.26e+06	377.26
R^2	0.793	0.850	0.661	0.668
No. of observations	322	322	322	322
No. of groups	23	23	23	23
Wu-Hausman test[2]	χ^2 (18) = 24.68		χ^2 (18) = 0.86	

(b) 1992 – 1999

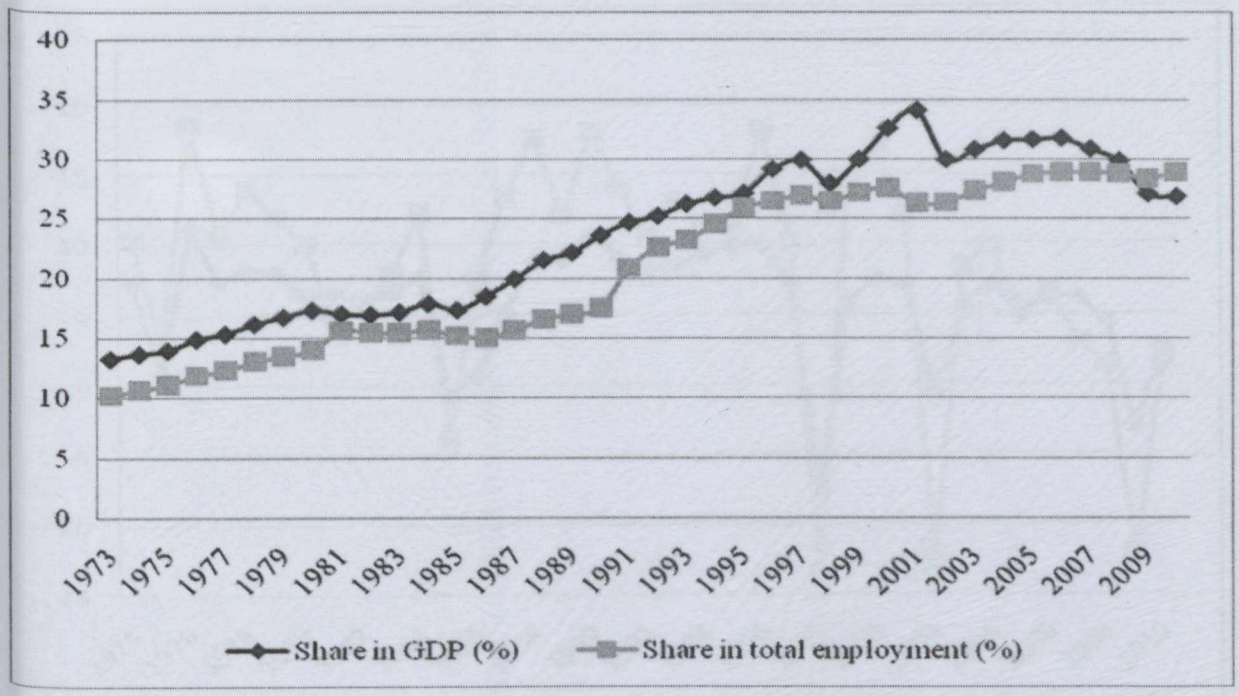
Regressors	All Workers		Unskilled Workers	
	FE	RE	FE	RE
	(1)	(2)	(3)	(4)
Constant term	6.405***	6.144***	6.079***	5.881***
	(0.233)	(0.162)	(0.299)	(0.193)
Migrant worker dependence (*FWD*)	0.003*	-0.0004	-0.001	-0.003**
	(0.002)	(0.001)	(0.002)	(0.001)
Real output (*RQ*)	0.057***	0.056***	0.068***	0.063***
	(0.012)	(0.009)	(0.016)	(0.011)
Capital intensity (*KL*)	0.124***	0.138***	0.100***	0.117***
	(0.013)	(0.012)	(0.017)	(0.014)
Skill intensity (*SKL*)	0.018***	0.029***	0.013***	0.023***
	(0.003)	(0.003)	(0.014)	(0.003)
Average firm size (*SIZE*)	-0.010	0.008	0.002	0.016
	(0.012)	(0.011)	(0.016)	(0.013)
Trade union dummy (*DTUN*)		-0.014		-0.082
		(0.060)		(0.068)
Time dummies	Yes	Yes	Yes	Yes
F-statistics	119.81		84.61	
Wald χ^2	7.10e+06	1231.37	5.29e+06	1231.80
R^2	0. 649	0.723	0.603	0.651
No. of observations	960	960	960	960
No. of groups	120	120	120	120
Wu-Hausman test[2]	χ^2 (12) = 64.00		χ^2 (12) = 21.98	

(c) 2000 - 2005

Regressors	All Workers		Unskilled Workers	
	FE	RE	FE	RE
	(1)	(2)	(3)	(4)
Constant term	6.717***	6.842***	6.200***	6.757***
	(0.232)	(0.165)	(0.323)	(0.202)
Migrant worker dependence (*FWD*)	-0.004	-0.007***	-0.010***	-0.008***
	(0.003)	(0.002)	(0.004)	(0.002)
Real output (*RQ*)	0.041***	0.032***	0.057***	0.037***
	(0.010)	(0.008)	(0.015)	(0.010)
Capital intensity (*KL*)	0.145***	0.146***	0.131***	0.114***
	(0.016)	(0.014)	(0.023)	(0.017)
Skill intensity (*SKL*)	0.005**	0.011***	-0.007**	0.001
	(0.002)	(0.002)	(0.003)	(0.003)
Average firm size (*SIZE*)	0.039**	0.051***	0.094***	0.070***
	(0.016)	(0.012)	(0.024)	(0.015)
Trade union dummy (*DTUN*)		-0.087*		-0.234***
		(0.052)		(0.062)
Time dummies	Yes	Yes	Yes	Yes
F-statistics	24.34		11.32	
Wald χ^2	1.28+07	515.79	5.87e+06	230.86
R^2	0.555	0.625	0.300	0.394
No. of observations	850	850	850	850
No. of groups	170	170	170	170
Wu- Hausman test[2]	χ^2 (9) = 785.12		χ^2 (9) = 45.41	

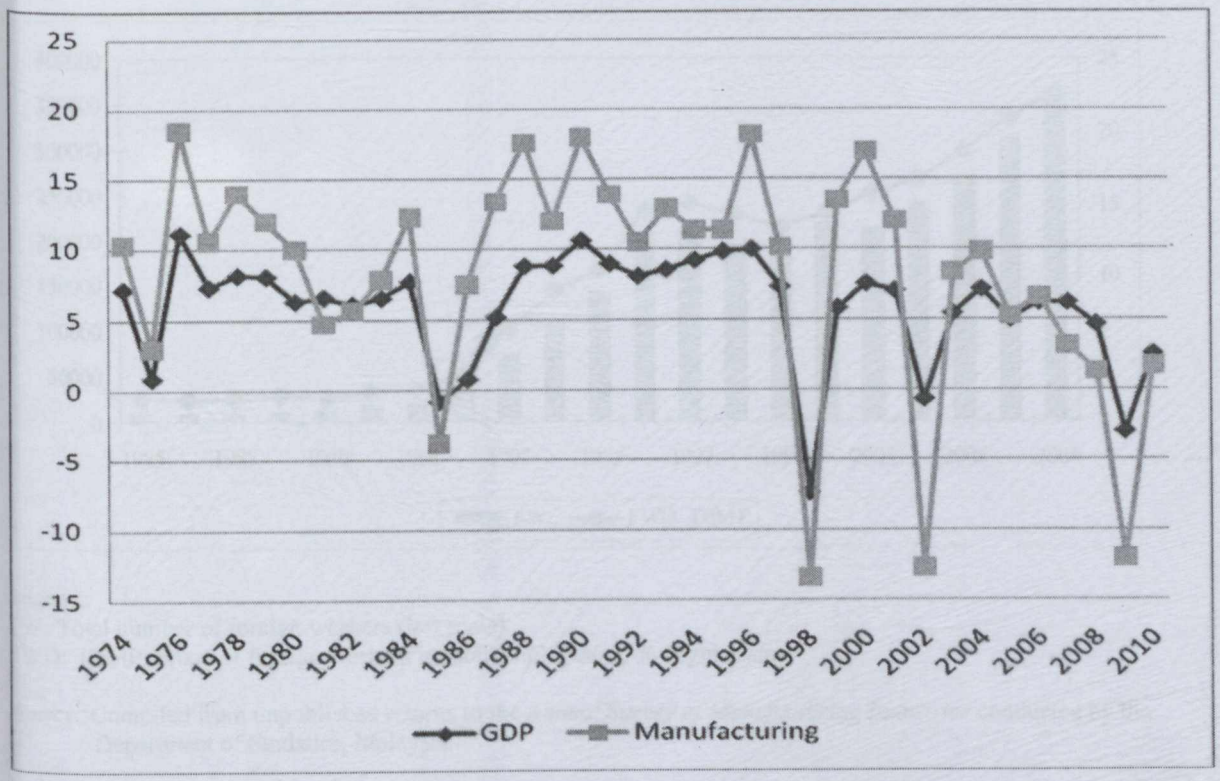
Notes: (1) Standard errors adjusted for arbitrary heteroskedasticity and intra-group correlation are given in brackets, with statistical significance denoted as *** 1%, ** 5% and * 10%.
(2) Null hypothesis is rejected at the one percent level.

Figure 1: Share of Manufacturing in GDP and Total Employment (in %)



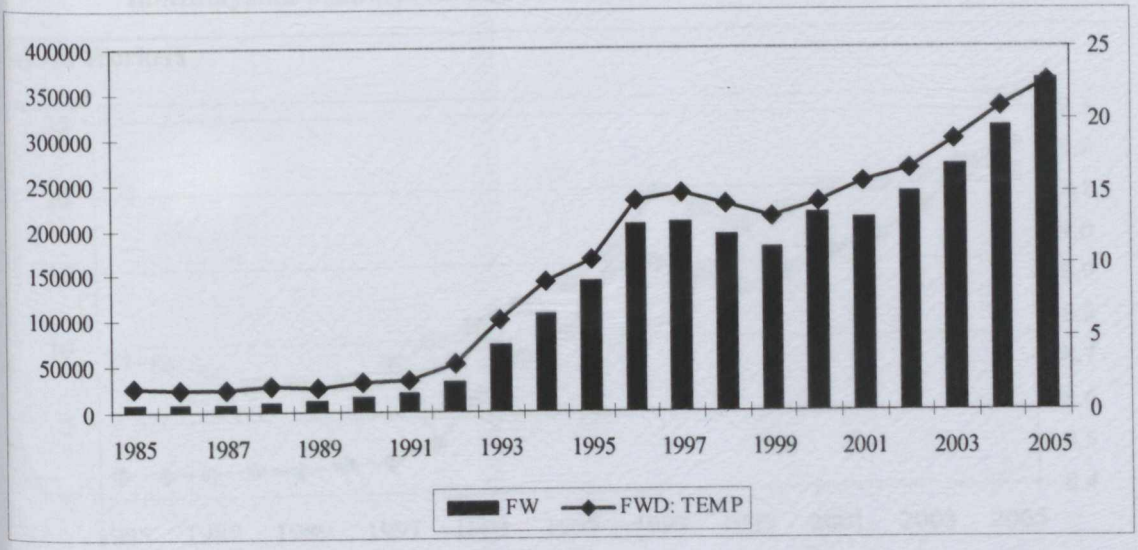
Source: Based on data compiled from *Monthly Statistical Bulletin*, Bank Negara Malaysia.

Figure 2: Growth of GDP and Manufacturing Value-Added (in %)



Source: Based on data compiled from *Monthly Statistical Bulletin*, Bank Negara Malaysia.

Figure 3: Foreign Workers in Malaysian Manufacturing, 1985-2005

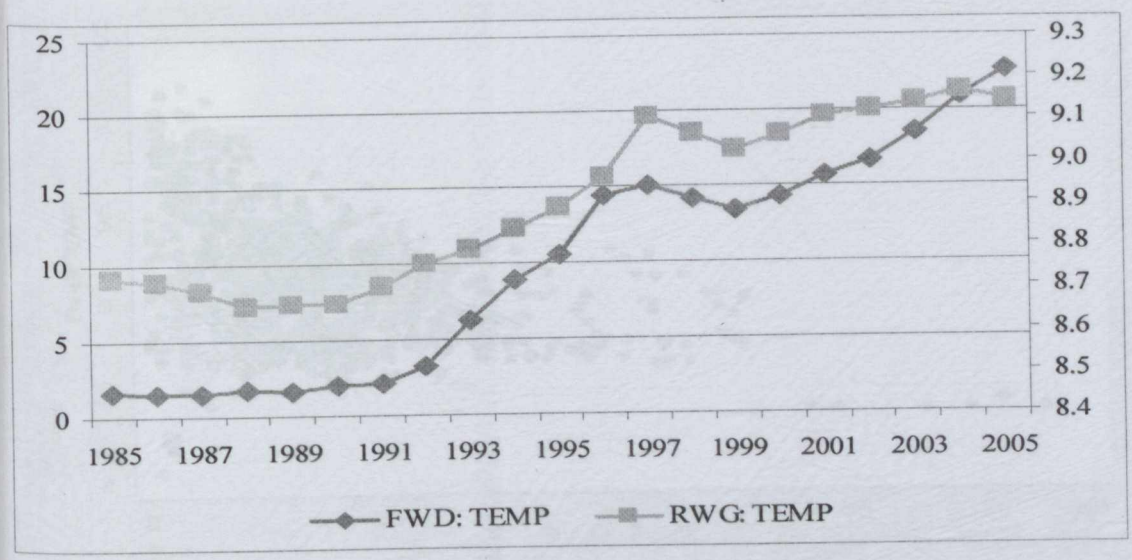


Legend:
FW: Total number of foreign workers (left scale)
FWD: TEMP: Share of foreign workers in total employment, % (right scale)

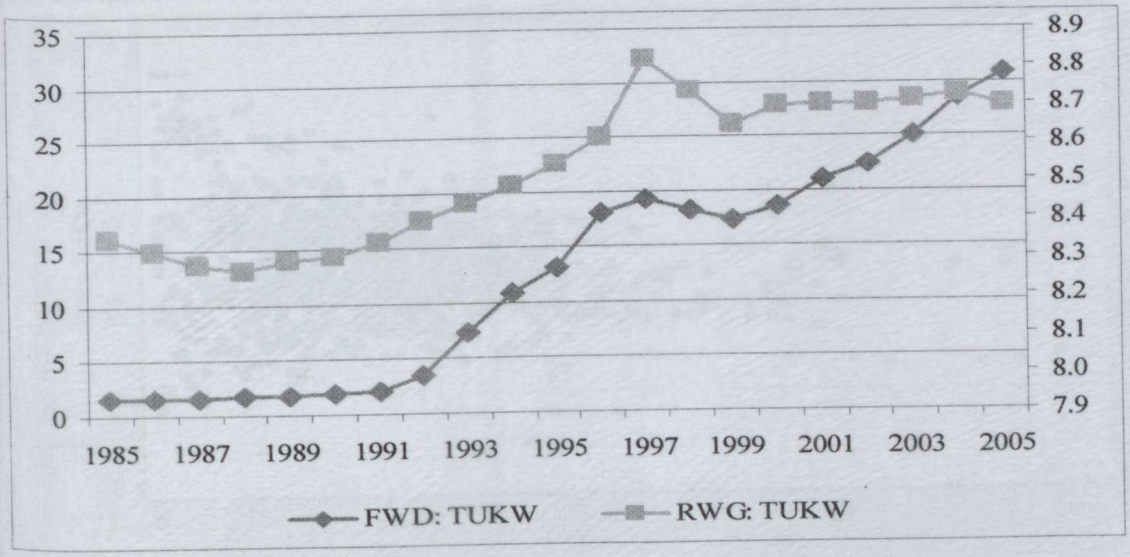
Source: Compiled from unpublished returns to the *Annual Survey of Manufacturing Industries* conducted by the Department of Statistics, Malaysia.

Figure 4: Share of Foreign Workers (%) and Real Annual Average Wages (in log) in Malaysian Manufacturing, 1985-2005

(a) All Workers



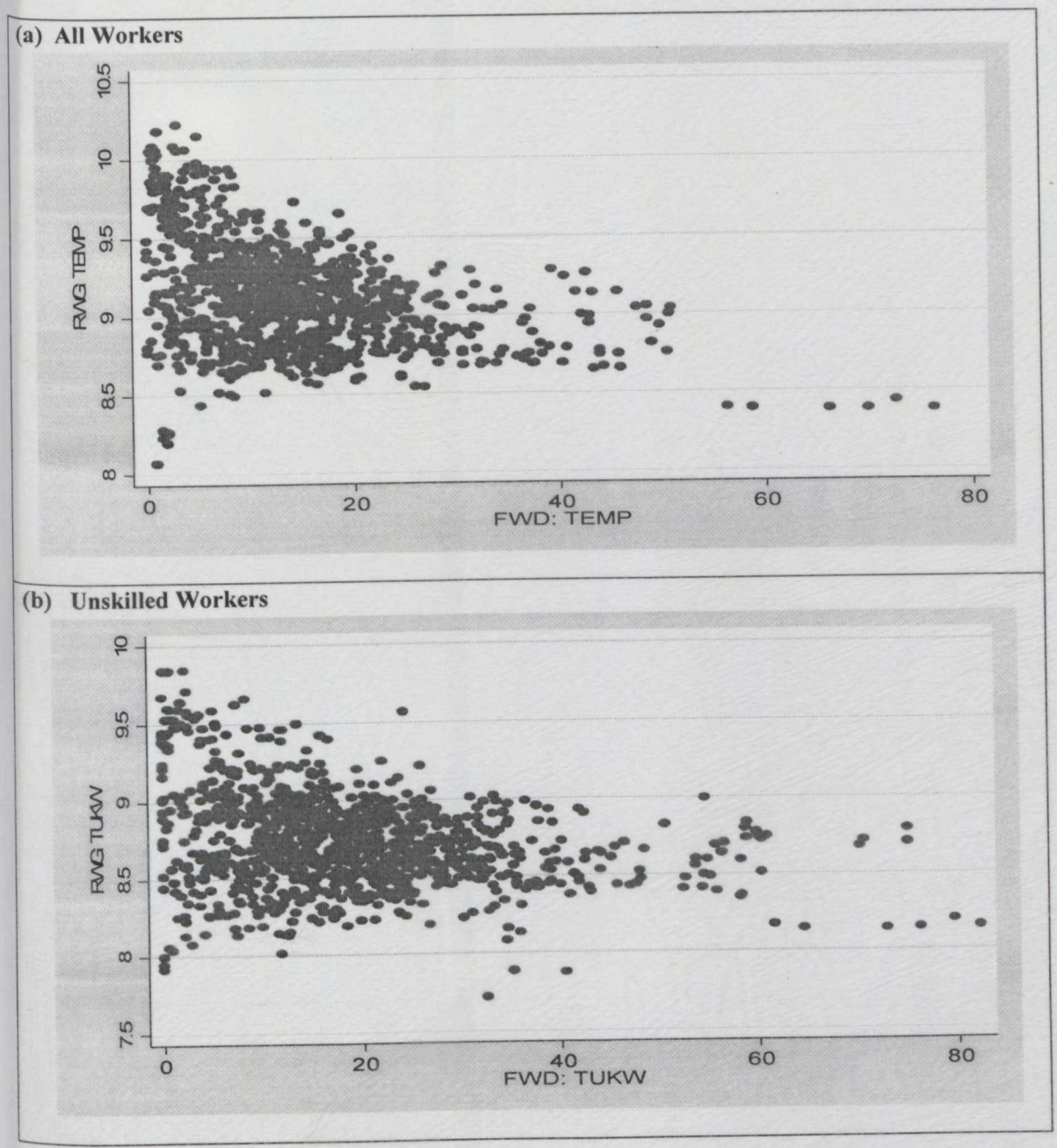
(b) Unskilled Workers



Legend:
FWD: TEMP: Share of foreign workers in total employment, % (left scale)
FWD: TUKW: Share of unskilled foreign workers in total unskilled production workers, % (left scale)
RWG: TEMP: Logarithmic of Real annual average wages of total employees (right scale)
RWG: TUKW: Logarithmic of Real annual average wages of unskilled production workers (right scale)

Source: Compiled from unpublished returns to the *Annual Survey of Manufacturing Industries* conducted by the Department of Statistics, Malaysia.

Figure 5: Share of Foreign Workers in Total Employment (%) and Real Annual Average Wages (in log) in MSIC 5-digit Industries, 2000-2005



Legend:
FWD: TEMP: Share of foreign workers in total employment, % (left scale)
FWD: TUKW Share of unskilled foreign workers in total unskilled production workers, % (left scale)
RWG: TEMP: Logarithmic of Real annual average wages of total employees (right scale)
RWG: TUKW: Logarithmic of Real annual average wages of unskilled production workers (right scale)

Source: Compiled from unpublished returns to the *Annual Survey of Manufacturing Industries* conducted by the Department of Statistics, Malaysia.